Uranium Energy Corp (UEC)

Goliad Project

Goliad County, Texas

Application to Conduct In Situ Uranium Recovery

July 31, 2007

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6.0 Hydrology

Section six of the Permit Application Technical Report describes the regional and permit area hydrology relevant to UEC's ISR project.

Regionally, the Goliad Sand is generally viewed as a large single aquifer system. However within the proposed UEC Permit Area, hydrogeological study indicates that the Goliad can be subdivided into four (4) sand layers with intervening layers of clay which constitute confining strata. The stratigraphic relationship of the individual sand layers is illustrated in the detailed strike and dip oriented cross-sections whose locations are shown on Figure 6.7 Cross-section Index Map). The cross-sections are presented as Figures 6.8 through 6.13. Table 6.1 provides information on: (1) the average depth from the surface to the top and base of each production sand; (2) the average elevation of the top and base of each production sand, relative to Mean Sea Level (MSL); and (3) the average thickness of each production sand. Water levels obtained from UEC's baseline wells can be found on Table 6.2.

Table 6.1 Production Zone Sand – Depth, Elevation and Average Thickness

Production Sand	Avg. Depth from Surface to Top (Feet)	Avg. Depth from Surface to Base (Feet)	Avg. Elevation from MSL* to Top (Feet)	Avg. Elevation from MSL * to Base (Feet)	Average Sand Thickness (Feet)
A Sand	45	99	197	131	65
B Sand	145	181	86	49	36
C Sand	212	269	3	-34	36
D Sand	304	385	-75	-155	80

*Mean Sea Level

Table 6.2 Permit Area Water Levels

Baseline Well	Water Level (Feet below Surface)
RBLA-1	63.18
RBLA-2	82.0
RBLA-3	79.0
RBLA-4	73.5
RBLA-5	72.5
RBLB-1	71.5
RBLB-2	55.0
RBLB-3	69.3
RBLB-4	70.3
RBLB-5	70.2
RBLC-1	74.5
RBLC-2	67.8
RBLC-3	62.5
RBLC-4	57.9
RBLC-7	76.0
RBLD-1	56.0
RBLD-2	81.6
RBLD-3	
RBLD-5	89.0
RBLD-6	89.0

Table 6.2 Permit Area Water Levels from Baseline Wells

	Depth to Ground Water Feet	Depth to Ground Water Feet*	Surface Elevation Feet
RBLA-1	64.61	62.86	221
RBLA-2	83.49	81.91	241
RBLA-3	80.50	79.38	238
RBLA-4	87.80	86.05	245
RBLA-5	74.54	72.46	231
RBLB-1	73.01	71.26	233
RBLB-2	50.30	49.05	220
RBLB-3	71.52	70.23	232
RBLB-4	71.73	70.19	233
RBLB-5	71.20	69.95	232
RBLC-1	76.50	74.71	244
RBLC-2	63.31	61.81	233
RBLC-3	64.53	62.86	226
RBLC-4	59.32	57.40	222
RBLC-7	71.20	70.24	245
RBLD-1	54.80	54.05	221
RBLD-2	83.32	81.24	231
RBLD-3A	70.00	69.00	220
RBLD-5	89.30	88.63	237
RBLD-6	88.35	87.10	254

*Depth to groundwater corrected for casing height above ground.

6.2.1 Permit Area Production Zone Sands

The four sand units have been internally labeled by UEC in descending order from the surface as: Sand A, Sand B, Sand C and Sand D. Each of these units constitutes a discrete individual aquifer unit within the mine area. In the study area, the Goliad Aquifer has a hydraulic gradient of approximately 5.5 feet per mile, and the direction of flow is to the southeast toward the Gulf of Mexico. Groundwater flow rate is approximately 6.7 feet per year.

Sand A is the uppermost sand in the permit area. This sand is the first sand unit encountered below the surface in the permit area. The average depth from the surface to the top of the sand is 45 feet, and its average thickness is 65 feet. It is capped by a clay layer of variable thickness that provides confinement. In a few small places outside of the area of mining interest, Sand A is exposed at the surface (Figures 6.8 through 6.13). Figures 6.14 and 6.15 are structure and isopach maps, respectively of Sand A within the permit area. The maps show faulting, variation in depth to the top of the unit and thickness of Sand A. Table 6.2 shows water levels taken from five baseline wells completed in Sand A. In general, Sand A is considered to be under water table conditions.

Sand B is the second aquifer unit encountered at an average depth of 145 feet BGL. Sand B is separated from the overlying Sand A by a substantial layer of clay, providing confinement. This confining layer is pervasive across the permit area. In general, Sand B is 36 feet thick and comprises one of the ore zones within the permit area. Figures 6.16 and 6.17 are structure and isopach maps, respectively of Sand B within the permit area. The maps show faulting, variation in depth to the top of the unit and thickness of Sand B. See Table 6.2 for Sand B water levels. In general, Sand B is also considered to be under confined conditions.

Sand C is the third sand unit encountered at an average depth of 212 feet BGL. Sand C is separated from the overlying Sand B by a substantial clay layer. In general, Sand C is 36 feet thick and comprises one of the ore zones within the permit area. Figures 6.18 and 6.19 are structure and isopach maps, respectively of Sand C within the permit area.

Sand D is the fourth sand unit encountered at an average depth of 304 feet BGL. This sand is separated from the overlying Sand C by a substantial clay layer that is pervasive throughout the permit area (see previously mentioned cross-sections). In general, Sand D is 80 feet thick and comprises one of the ore zones within the permit area. Figures 6.20 and 6.21 are structure and isopach maps, respectively of Sand D within the permit area. The maps show faulting, variation in depth to the top of the unit and thickness of Sand D. Sand D also is considered to be under confined conditions.

The Lagarto Clay (Fleming Group) is the next stratigraphic unit encountered beneath the Goliad Sand. The Lagarto conformably overlies the Oakville Sandstone in Goliad County. The Lagarto is reported to consist of up to 1,200 feet of dark colored clay and sandy clay with intercalated beds of sand and sandstone. In the permit area, the sand beds contain fresh water, which may be of better quality than that found in the overlying Goliad (Dale, et al. 1957). In general, the upper part of the Lagarto is sandier than the middle and lower portions. The sands in the upper portion of the Lagarto are considered to be part of the Evangeline Aquifer System, however the sands are separated from the overlying Goliad by relatively thick clay layers and probably constitute a discrete aquifer system comprising the first underlying aquifer. The middle and lower portions of the Lagarto constitute the Burkeville Confining System hydrostratigraphic unit described previously. However, discrete sands within the lower and middle Lagarto may contain large supplies of fresh water, which is reported to be under artesian pressure in the middle part of Goliad County (Dale, et al. 1957). The town of Goliad, which is located approximately 14-miles to the south of the permit area, utilizes municipal water supply wells producing from the Lagarto Clay.

The direction of groundwater flow, hydraulic gradient and flow velocity were discussed earlier in this section. Figures 6.22 and 6.23 show the potentiometric surface for UEC’s project site and for the region, respectively.

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7.0 Geology

7.2 Permit Area Geology

As indicated in previously referenced Figures 7.3 and 7.6, the permit area is located within the outcrop of the Goliad Sand. The Goliad Sand generally consists of up to 500 feet of light colored sand and sandstone (typically impregnated with caliche) interbedded with clay and gravel. In Goliad County, the subsurface strata generally strike from southwest to northeast and dip to the southeast at approximately 20 feet/mile near the outcrop, and up to 70 feet/mile away from the outcrop (Dale, et al., 1957).

7.2.1 Permit Area Stratigraphy and Lithology

Within the permit area, the Goliad Formation consists predominantly of fluvial facies, having a relatively high sand content (Figure 7-13). The up dip parts of the sand axes contain abundant amounts of coarse grained sand and gravel deposited by braided streams and grade down dip into meanderbelt deposits. Farther down dip, the fluvial system grades into deposits of a wave-dominated deltaic system. In general, the relict river systems to the north of the San Antonio River carried higher sand loads than the relict river systems to the south (Solis, 1981).

The Goliad Formation is approximately 400 feet thick in the permit area. As noted in Section 6.2, it is divided into four discrete sand units: Sand A, Sand B, Sand C, and Sand D. Each of the sand units, with the exception of Sand A in few places, is overlain and underlain by a relatively thick clay layer throughout the study area. Each of these sand units appears to constitute a discrete individual aquifer unit within the mine area and all are within the proposed aquifer exemption zone. Figures 6-8 through 6-13 are detailed strike and dip oriented cross-sections through the proposed permit area which show the stratigraphical, lithological, and structural relationships of the individual sand units.

Sand A is exposed at the surface in the central part of the permit area and no overlying clay is present. This uppermost surface is erosional in this area. As noted previously, this part of the site is not included in any production areas.

Sand B is the second sand unit in the permit area. Again, as noted previously, Sand B lies below Sand A and is isolated from Sand A by a clay barrier. As shown on cross-sections (Figure 6.8 through 6.13), and on the structure and isopach maps (Figures 6.16 and 6.17), the unit thins and thickens within the permit area in a sinuous pattern which is characteristic of a fluvial environment. The average depth to the base of Sand B is 181 feet BGL, and the average thickness is 36 feet.

Sand C is the third unit encountered below the surface in the permit area. As shown on the cross-sections (Figures 6.8 through 6.13) and on the structure and isopach maps (Figures 6.18 and 6.19, respectively) the unit is found in the western part of the permit area and peters out to the north and east. Where the unit is present, it thins and thickens in a sinuous pattern which is characteristic of a fluvial depositional environment. The average depth to the base of Sand C is 269 feet BGL and its average thickness is 36 feet.

Sand D is the fourth and lowermost sand unit encountered below the surface in the permit area. A review of the cross-sections (Figures 6.8 through 6.13) and the structure and isopach maps (Figures 6.20 and 6.21, respectively) show the unit is found throughout the permit area. As with the previously described sand units, Sand D thins and thickens in a sinuous pattern that is characteristic of a fluvial depositions environment. The average depth to the base of Sand D is 385 feet BGL and its average thickness is 80 feet.

The Lagarto Formation (aka Lagarto Clay) of the Fleming Group (Miocene) underlies the Goliad in the Permit Area and extends from the base of the Goliad to a depth of approximately 1600 feet BGL. The upper Lagarto looks very similar lithologically to the Goliad. In general, the upper part of the Lagarto is sandier than the middle and lower portions. The sands in the upper portion of the Lagarto are considered part of the

Evangeline Aquifer System, however the sands are separated from the overlying Goliad by relatively thick clay layers and probably constitute a discrete aquifer system comprising the first underlying aquifer. In general, the Lagarto is described as clay and sandy clay with intercalated beds of sand and sandstone (Dale, et al., 1957).

The Lagarto is underlain by the Oakville Sandstone (Fleming Group-Miocene). The Oakville unconformably overlies the Catahoula Tuff and crops out to the west and northwest of Goliad County. The Oakville consists of up to 700 feet of crossbedded sand and sandstone interbedded with lesser amounts of sandy, ashy, bentonitic clay. In general, the base of the Oakville marks the base of the USDW in the vicinity of the proposed UEC Permit Area.

7.2.2 Permit Area Structural Geology

As indicated on previously referenced cross-sections and project maps, two strike oriented (southwest to northeast) normal faults are present in the permit area. It appears that both faults are high angle since no fault cuts were readily discernible within the log data reviewed. However, the faults are mapped based on stratigraphic offset of correlative beds as indicated on the cross-sections. The fault in the northwest portion of the project area is downthrown on the south side of the fault and demonstrates variable offset but generally indicates approximately 100 feet of displacement at the top of the Sand A structural surface (Figure 6.14).

The fault in the southeast portion of the project area is downthrown on the north side of the fault and the two faults generally form a graben structure between them (Figure 6.12). The south fault also shows variable offset but generally about 60 feet of displacement at the top of the Sand A structural surface (Figure 6.14) is indicated.

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14.0 Proposed Aquifer Exemption

Prior to the start of operations, an Aquifer Exemption must be issued by the U.S. EPA through TCEQ. The federal criteria for exempted aquifers are given in 40 CFR §146.4, and the corresponding TCEQ criteria can be found in 30 TAC §331.13 Exempted Aquifer.

The extent of the aquifer exemption is shown on all of the cross-sections (see Figures 6.8a through 6.13). As shown, the exempted portion would extend from the base of the D Sand to the top of the A Sand. The ore delineation program that UEC is engaged in clearly demonstrates that commercial-grade uranium deposits exist in all four sand units. As cross-sections (6.8 through 6.13) show, each sand unit is confined on the top and the bottom by substantial aquicludes. With regard to overlying and underlying aquifers, please refer to the cross-sections to see that an overlying aquifer does not exist above the A Sand production zone. The cross-sections also illustrate that within the prospective production areas, overlying non-production zone aquifers, do not exist. The reason for this is that all four sand units contain commercial amounts of uranium. The deepest production zone (D-Sand) has a substantial confining layer between it and deeper aquifers. This confining layer exists throughout the permit area (see cross-sections). At this stage of project development, the lateral extent of the aquifer exemption area would encompass all of the production areas shown on Figure 1.3 Project Map. Because project development is ongoing, additional aquifer exemption areas will be needed in the permit area.